

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) An automated meter reading network system comprising:

a plurality of utility meters each one positioned remote from the other ones of the plurality of utility meters;

a plurality of sensors interfaced with each of the plurality of meters so that at least one of the plurality of sensors interfaces with and is positioned adjacent at least one of the plurality of meters to thereby sense utility usage data from each of the plurality of meters;

a communication network;

a plurality of meter data collectors positioned to collect utility usage data from each of the plurality of sensors so that at least one of the plurality of meter data collectors is positioned adjacent at least one of the plurality of utility meters and in communication with at least one of the plurality of sensors which interfaces with the at least one of the plurality of utility meters, the plurality of meter data collectors also being adapted to be positioned in communication with each other through the communication network so that each of the plurality of meter data collectors defines a communication node in the communication network and the plurality of meter data collectors defines a plurality of communication nodes in the network; and

a host computer positioned remote from the plurality of meter data collectors at a utility central station and in communication with each of the plurality of meter data collectors in the communication network so that each one of the plurality of meter data collectors are adapted to communicate with other ones of the plurality of meter data collectors in the communication network, the host computer including network software including instructions that when executed by the host computer cause the host computer to perform the operations of determining~~positioned to determine~~ a preferred polling sequence route responsive at least in part to a strength of communication signal between the host computer and each of the plurality of meter data collectors and between each of the plurality of meter data collectors along the determined polling sequence route; ~~and positioned to determine a respective preferred~~

~~communication sequence path to the host computer for each respective polled meter data collector to thereby reduce line-of-site communication problems between each of the plurality of meter data collectors and the host computer, and sending a message packet including routing data to route the message packet along the preferred polling sequence route between the host computer and a selected meter data collector defining a destination node and along the preferred polling sequence route between the destination node and the host computer, the message packet collecting strength of communication signal data between each node along the preferred polling sequence route to the destination node and along the preferred polling sequence route to the host computer,~~

the network software including an autosequencer positioned to initiate systematic polling of the plurality of meter data collectors whereby each of the plurality of meter data collectors is individually attempted to be polled by the host computer to determine a strength of communication signal between the host computer and each of the plurality of meter data collectors, and whereby each of the plurality of meter data collectors also attempt to communicate with each other responsive to the autosequencer to determine a strength of communication signal between one of the plurality of meter data collectors and another one of the plurality of meter data collectors, the autosequencer further positioned to determine a communication sequence to each of the plurality of meter data collectors responsive to the strength of communication signal between the host computer and each of the plurality of meter data collectors and responsive to the strength of communication signal between each of the plurality of meter data collectors to define the preferred polling sequence route to each of the plurality of meter data collectors from the host computer, and to update the preferred polling sequence route responsive to strength of communication signal data gathered by each message packet after each subsequent polling sequence to allow the preferred polling sequence route to vary over time.

2. (Currently amended) A system as defined in Claim 1, wherein the message packet includes a payload data section for retrieving utility usage data from at least one of the plurality of meter data collectors, and wherein each of the plurality of meter data collectors includes a collector

transceiver positioned to transmit data to the host computer and to other ones of the plurality of meter data collectors through the communication network and to receive data from the host computer and from the other ones of the plurality of meter data collectors through the communication network and a collector controller positioned to control collecting of utility usage data from at least one of the plurality of sensors, and the transmitting to transfer data to and to receive receiving of data to and from the collector transceiver, and to add the utility usage data to the payload data section responsive to the routing data.

3. (Previously presented) A system as defined in Claim 2, wherein the host computer includes a host radio frequency transceiver positioned to transmit data to and receive data from each of the plurality of meter data collectors and a host controller positioned to control collecting of utility usage data from each of the plurality of meter data collectors, transmitting data to each of the plurality of meter data collectors through the host transceiver, and receiving data from each of the plurality of meter data collectors through the host transceiver.

4. (Currently amended) A system as defined in Claim 31,

wherein the message packet includes a payload data section for retrieving utility usage data from at least one of the plurality of meter data collectors;

wherein each of the plurality of meter data collectors includes a collector transceiver positioned to transmit data to the host computer and to other ones of the plurality of meter data collectors through the communication network and to receive data from the host computer and from the other ones of the plurality of meter data collectors through the communication network, and a collector controller positioned to control collecting of utility usage data from at least one of the plurality of sensors and loading the utility usage data in the payload data section of the message packet;

wherein the host computer includes a host controller positioned to control collecting of utility usage data from each of the plurality of meter data collectors, routing the message packet

through the communication network to the destination node to collect the utility usage data through the communication network from at least one of the nodes along the preferred polling sequence route to the destination node, and retrieving the utility usage data from the routed message packet;

wherein each collector controller of the plurality of meter data collectors and the host controller include ~~controller-network~~ software associated with the controller and having a network data communication protocol;

wherein the network data communication protocol includes a preselected application layer; and

wherein the communication network comprises a radio frequency communication network.

5. (Currently amended) A system as defined in Claim 4,

wherein the radio frequency communication network has a frequency in the range of 850-1000 mega-hertz, wherein the frequency continuously changes between a different one of a plurality of preselected frequencies between complete data packet transmissions to thereby define frequency hopping;

wherein the ~~network controller~~ software of the host controller initiates polling of the plurality of meter data collectors through the frequency hopping within the communications network; and

wherein each of the plurality of meter data collectors responds to the polling by the host controller through the frequency hopping within the communications network along the respective preferred ~~communication path~~ polling sequence route.

6. (Canceled).

7. (Canceled).

8. (Currently amended) A system as defined in Claim 71, wherein the plurality of meter data collectors include a first meter data collector, a second meter data collector in communication with the first meter data collector, and a third meter data collector in communication with at least one of the first and second meter data collectors, wherein the first meter data collector is positioned remote from the host computer to thereby have a greater signal strength than the second meter data collector and the third meter data collector, wherein the second meter data collector is positioned remote from host computer to thereby have a greater signal strength than the third meter data collector, and wherein the network software further includes a raking router to collect ~~meter~~ utility usage data from the first meter data collector responsive to polling received from the host computer and to rakingly collect data from each of the second and third meter data collectors responsive to the polling so that ~~meter~~ utility usage data is collected from each of the first, second, and third meter data collectors responsive to polling the first meter data collector and routed to the host computer.

9. (Currently amended) A system as defined in Claim 78, wherein at least one of the plurality of meter data collector is positioned within ~~at least one of the following: the same housing as at least one of the plurality of utility meters, the housing having a glass facing on at least one side thereof, the meter data collector positioned within the housing to transmit through the glass, a separate housing positioned closely adjacent at least one of the plurality of utility meters, and a separate housing positioned closely adjacent a subset of the plurality of utility meters.~~

10. (Currently amended) A system as defined in Claim 17, wherein the host computer further includes memory having a meter data collector database associated therewith to thereby store meter collector data associated with each of the plurality of meter data collectors, the meter collector data including collector identification, collector physical address, and strength of signal between collectors.

11. (Currently amended) An automated meter reading network system comprising:

a plurality of sensors adapted to be interfaced with each of a plurality of utility meters each positioned remote from another one of the plurality of utility meters so that at least one of the plurality of sensors interfaces with and is positioned adjacent at least one of the plurality of meters to thereby sense utility usage data from each of the plurality of meters;

a plurality of meter data collectors positioned to collect utility usage data from each of the plurality of sensors so that at least one of the plurality of meter data collectors is positioned in communication with at least one of the plurality of sensors, the plurality of meter data collectors also being adapted to be positioned in communication with each other through the communication network so that each of the plurality of meter data collectors defines one of a plurality of meter data collectors in a communication network; and

a host computer positioned remote from the plurality of meter data collectors and in communication with each of the plurality of meter data collectors so that each one of the plurality of meter data collectors are adapted to communicate with other ones of the plurality of meter data collectors, positioned to poll each of the plurality of meter data collectors, and positioned to determine a respective preferred multi-node communication sequence path between to the host computer and a selected meter data collector defining a destination node for including at least one other of each respective the polled meter data collector/collectors defining at least one intermediate routing node located between the host computer and the destination node, and positioned to send a message packet including routing data to route the message packet along the preferred communication sequence path between the host computer and the destination node via the at least one intermediate routing node, the message packet configured to rakingly collect respective utility usage data from both the destination node and the at least one intermediate routing node located along the preferred communication sequence path so that utility usage data is collected by the message packet from both the destination node and the at least one intermediate routing node along the preferred communication sequence path for delivery to the host computer.

12. (Currently amended) A system as defined in Claim 11, wherein the message packet includes a payload data section for retrieving utility usage data from at least one of the plurality of meter data collectors, and wherein each of the plurality of meter data collectors includes a collector transceiver positioned to transmit data to the host computer and to other ones of the plurality of meter data collectors and to receive data from the host computer and from the other ones of the plurality of meter data collectors, and a collector controller positioned to control collecting of utility usage data from at least one of the plurality of sensors, and the transmitting to transfer data to and to receive receiving of data to and from the collector transceiver, and to add the utility usage data to the payload data section of the message packet responsive to the routing data.

13. (Previously presented) A system as defined in Claim 12, wherein the host computer includes a host transceiver positioned to transmit data to and receive data from each of the plurality of meter data collectors and a host controller positioned to control collecting of utility usage data from each of the plurality of meter data collectors, transmitting data to each of the plurality of meter data collectors through the host transceiver, and receiving data from each of the plurality of meter data collectors through the host transceiver.

14. (Currently amended) A system as defined in Claim ~~11~~13,

wherein the message packet includes a payload data section for retrieving utility usage data from at least one of the plurality of meter data collectors;

wherein each of the plurality of meter data collectors includes a collector transceiver positioned to transmit data to the host computer and to other ones of the plurality of meter data collectors through the communication network and to receive data from the host computer and from the other ones of the plurality of meter data collectors through the communication network, and a collector controller positioned to control collecting of utility usage data from at least one of the plurality of sensors and loading the utility usage data in the payload data section of the message packet;

wherein the host computer includes a host controller positioned to control collecting of utility usage data from each of the plurality of meter data collectors, routing the message packet through the communication network to the destination node to collect the utility usage data through the communication network from at least one of the nodes along the preferred polling sequence route to the destination node, and retrieving the utility usage data from the routed message packet;

wherein each collector controller of the plurality of meter data collectors and the host controller include ~~controller~~ network software associated with the controller and having a network data communication protocol;

wherein the network data communication protocol includes a preselected application layer; and

wherein the communication network comprises a radio frequency communication network.

15. (Currently amended) A system as defined in Claim 14,

wherein the radio frequency communication network has a frequency in the range of 850-1000 mega-hertz, wherein the frequency continuously changes between a different one of a plurality of preselected frequencies between complete data packet transmissions to thereby define frequency hopping;

wherein the controller software of the host controller initiates polling of the plurality of meter data collectors through the frequency hopping within the communications network; and

wherein each of the plurality of meter data collectors responds to the polling by the host computer through the frequency hopping within the communications network.

16. (Currently amended) A system as defined in Claim 15,

wherein the host computer includes network software;

wherein the network software includes an autosequencer positioned to initiate polling of the plurality of meter data collectors whereby each of the plurality of meter data collectors is individually attempted to be polled by the host computer to determine a strength of communication signal between the host computer and each of the plurality of meter data collectors, ~~wherein~~ and whereby each of the plurality of meter data collectors also attempt to communicate with each other responsive to the autosequencer to determine a strength of communication signal between one of the plurality of meter data collectors and another one of the plurality of meter data collectors, and ~~wherein~~ the autosequencer further positioned to determine ~~determines~~ a communication sequence to each of the plurality of meter data collectors responsive to the strength of communication signal between the host computer and each of the plurality of meter data collectors and responsive to the strength of communication signal between each of the plurality of meter data collectors to define the preferred communication sequence path to each of the plurality of meter data collectors from the host computer.

17. (Currently amended) A system as defined in Claim 16, wherein the autosequencer updates each ~~the~~ preferred communication sequence path to allow each ~~the~~ preferred communication sequence path to each separate one of the plurality of meter data collectors to vary over time.

18. (Currently amended) A system as defined in Claim 17 ~~11~~, wherein the plurality of meter data collectors include a first meter data collector, a second meter data collector in communication with the first meter data collector, and a third meter data collector in communication with at least one of the first and second meter data collectors, wherein the first meter data collector is positioned remote from the host computer to thereby have a greater signal strength than the second meter data collector and the third meter data collector, wherein the second meter data

collector is positioned remote from host computer to thereby have a greater signal strength than the third meter data collector, and wherein the network software further includes a raking router to collect ~~the meter~~ utility usage data from the first meter data collector responsive to polling received from the host computer and to rakingly collect utility usage data from each of the second and third meter data collectors responsive to the polling so that ~~meter~~ utility usage data is collected from each of the first, second, and third meter data collectors by the same message packet responsive to polling the first meter data collector and is routed to the host computer.

19. (Currently amended) A system as defined in Claim 11, wherein at least one of the plurality of meter data collector is positioned within ~~at least one of the following: the same housing as at least one of the plurality of utility meters, the housing having a glass facing on at least one side thereof, the meter data collector positioned within the housing to transmit through the glass; a separate housing positioned closely adjacent at least one of the plurality of utility meters, and a separate housing positioned closely adjacent a subset of the plurality of utility meters.~~

20. (Original) A system as defined in Claim 11, wherein the host computer further includes a memory having a meter data collector database associated therewith to thereby store meter collector data associated with each of the plurality of meter data collectors, the meter collector data including collector identification, collector physical address, and strength of signal between meter data collectors.

21. (Currently amended) A meter data collector to interface with a utility meter, the meter data collector including:

a stationary housing adapted to contain a utility meter;

a sensor positioned to sense ~~meter~~ utility usage data from the utility meter;

a high power transceiver associated with the housing to transmit ~~meter~~ utility usage data from the meter data collector and to receive ~~communication~~ communications remote from the stationary housing in a medium to high range;

a collector controller positioned within the housing to control data communication to and from the high power transceiver and to provide bidirectional radio frequency communication between an adjacent at least one other meter data collector to form a communication network, and to control collecting of local ~~meter~~ utility usage data from the sensor responsive to a remote command from a requesting remote host computer; and

a memory positioned within the stationary housing and associated with and in communication with the controller to store data therein, the memory including network software to receive a message packet including a payload carrying utility usage data from the at least one other meter data collector, to combine the local utility usage data with the utility usage data from the at least one other meter data collector, and to communicate the ~~meter~~ utility usage data remotely through the communication network to the requesting remote host computer along a route determined by the requesting remote host computer.

22. (Original) A meter data collector as defined in Claim 21, wherein the network software includes a preselected network data communication protocol, wherein the network data communication protocol includes a preselected application layer, and wherein the communication network comprises a radio frequency communication network.

23. (Currently amended) A meter data collector as defined in Claim 22, wherein the radio frequency communication network has a frequency in the range of 850-1000 mega-hertz, wherein

the frequency continuously changes between a different one a plurality of preselected frequencies between complete data packet transmissions to thereby define frequency hopping, wherein a remote host computer controller initiates polling of the meter data collector through the frequency hopping within the communications network, and wherein the collector controller is positioned to respond to the polling by the host computer controller through the frequency hopping within the communications network.

24. (Currently amended) A meter data collector as defined in Claim 23, wherein the host computer includes network software which includes an autosequencer to initiate polling by the host computer controller and to initiate polling of at least one of a plurality of the meter data collectors whereby each of the plurality of meter data collectors is individually attempted to be polled by the host computer to determine a strength of communication signal between the host computer and each of the plurality of meter data collectors, and ~~wherein~~ whereby each of the plurality of meter data collectors are positioned to also attempt to communicate with each other responsive to the autosequencer to determine a strength of communication signal between one of the plurality of meter data collectors and another one of the plurality of meter data collectors to thereby assist in determining a preferred communication sequence path to each of the plurality of meter data collectors from the host computer.

25. (Original) A meter data collector as defined in Claim 24, wherein the autosequencer updates the preferred communication sequence path to allow the preferred communication sequence path to vary over time.

26. (Currently amended) A method of collecting utility meter usage data, the method comprising:
 sensing-meter utility usage data from each of a plurality of utility meters positioned remote from each other;

collecting utility usage data by each of a plurality of meter data collectors positioned adjacent each of the plurality of utility meters;

determining by a remote host computer a preferred polling sequence route responsive to a strength of communication signal between ~~the~~a-remote host-computer and each of the plurality of meter data collectors;

polling each of the plurality of meter data collectors by the remote host computer with the preferred polling sequence ~~by the host computer positioned remote from the plurality of meter data collectors~~; and

transmitting ~~meter~~ utility usage data to the remote host computer from each of the plurality of meter data collectors along the same preferred polling sequence route responsive to the polling by the host computer.

27. (Original) A method as defined in Claim 26, wherein the steps of polling and determining are periodically performed to update the preferred polling sequence route over time.

28. (Currently amended) A method as defined in 27, wherein the plurality of meter data collectors include a first meter data collector, a second meter data collector in communication with the first meter data collector, and a third meter data collector in communication with at least one of the first and second meter data collectors, wherein the first meter data collector is positioned remote from the host computer to thereby have a greater signal strength than the second meter data collector and the third meter data collector, wherein the second meter data collector is positioned remote from host computer to thereby have a greater signal strength than the third meter data collector, and the method further comprising rakingly collecting data from each of the second and third meter data collectors responsive to the polling of the first meter data collector so that ~~meter~~ utility usage data is collected from each of the first, second, and third meter data collectors responsive to polling the first meter data collector and routing the rakingly collected ~~meter~~ utility usage data to the host computer.

29. (Currently amended) A method as defined in Claim 27, wherein at least one of the plurality of meter data collector is positioned within ~~at least one of the following: the same housing as at least one of the plurality of utility meters, the housing having a glass facing on at least one side thereof, the meter data collector positioned within the housing to transmit through the glass, a separate housing positioned closely adjacent at least one of the plurality of utility meters, and a separate housing positioned closely adjacent a subset of the plurality of utility meters.~~

30. (Original) A method as defined in Claim 29, wherein the host computer includes a memory having a meter data collector database associated therewith to thereby store meter collector data associated with each of the plurality of meter data collectors, the meter collector data including collector identification, collector physical address, and strength of signal between meter data collectors.

31. (Currently amended) A method of monitoring a utility meter mounted to a building, the method comprising:

- mounting a meter data collector defining a remote collection unit adjacent a utility meter mounted to a building;

- collecting meter data from the utility meter by the remote collection unit;

- transmitting the ~~meter~~ utility usage data to a router of a communication network service provider along a predetermined multi-hop communication sequence path responsive to a request by a requesting computer device provided in a data packet ~~payload~~, the data packet including routing data to route the utility usage data along a specific route provided by the requesting computer device;

- transmitting the ~~meter~~ utility usage data through a communication network associated with the communication network service provider in the data packet payload; and

receiving the ~~meter~~ utility usage data from the communication network by the computer device.

32. (Currently amended) A method as defined in Claim 31, wherein the remote collection unit comprises a first remote collection unit, the utility meter comprises a first utility meter, and the building comprises a first building, ~~and the method further comprises~~ comprising mounting a second remote collection unit adjacent a second utility meter mounted to a second building, ~~collecting meter~~ utility usage data from the second utility meter by the second remote collection unit, and transmitting the ~~meter~~ utility usage data from the second utility meter by the second remote collection unit, ~~and transmitting the meter data of the second utility meter to the first remote collection unit,~~ and wherein the meter data transmitted to the router comprises ~~meter~~ utility usage data consolidated from both the first and second remote collection units.

33. (Previously presented) A method of collecting utility meter data from a plurality of utility meters each mounted to a different building and each in communication with a respective one of a plurality of meter data collectors defining a plurality of remote collection units, the method comprising:

transmitting utility meter data from a first remote collection unit of the plurality of remote collection units to a second remote collection unit of the plurality of collection units;

consolidating the utility meter data of the first remote collection unit with the utility meter data of the second remote collection unit into a same data payload; and

transmitting the utility meter data of the first remote collection unit and the utility meter data of the second remote collection unit from the second remote collection unit to a host computer.

34. (Currently amended) A method as defined in Claim 33, further comprising transmitting meter data from a third remote collection unit to the first remote collection unit, and wherein the utility meter data of the first remote collection unit includes utility meter data from the third remote collection unit.

35. (Currently amended) A method of collecting utility meter data, the method comprising:

positioning a meter data collector defining a remote collection unit having bi-directional radio frequency data communication within a housing having a glass facing on at least one side thereof;

collecting utility meter data by the remote collection unit positioned within the housing;

polling the remote collection unit from a host computer by radiofrequency data communication through the glass facing, the polling including sending a message packet including a preferred polling sequence route; and

transmitting the collected utility meter data from the remote collection unit through the glass facing to the host computer along the preferred sequence route provided in the message packet by the host computer responsive to the polling.

36. (Original) A method as defined in Claim 35, wherein the utility meter comprises a first utility meter of a plurality of utility meters, wherein the first utility meter comprises one of a gas utility meter, an electric utility meter, and a water meter, wherein a second of the plurality of utility meters comprises a different one of a gas utility meter, an electric utility meter, and a water utility meter, and wherein the step of collecting includes collecting utility meter data from both the first and second utility meters by the remote collection unit.

37. (Currently amended) A method of collecting utility meter data, the method comprising:

positioning a plurality of meter data collectors defining a plurality of remote collection units adjacent to respective one of a plurality of utility meters, each of the plurality of remote collection units in communication with at least two other of the plurality of remote control units, each of the plurality of utility meters being mounted to a different building;

polling each of the plurality of remote collection units along a preferred polling sequence route from a collection computer positioned remote from the plurality of remote collection units; and

transmitting meter data from each of the plurality of remote collection units to the collection computer along ~~the~~ a same preferred polling sequence route provided in a message packet by the host computer responsive to the polling.

38. (Original) A method as defined in Claim 37, wherein the collection computer comprises a field collection unit.

39. (Original) A method as defined in Claim 37, wherein the collection computer comprises a host computer.

40. (Original) A method as defined in Claim 38, further comprising a host computer positioned remote from and in communication with the field collection unit.

41. (Original) A method as defined in Claim 38, further comprising transmitting the utility meter data from the field collection unit to a router of a communication network service provider, communicating the utility meter data through a communication network associated with the communication network service provider, and receiving the utility meter data by a host computer in communication with the communication network.

42. (Currently amended) A method as defined in Claim 38, wherein a first remote collection unit of the plurality of remote collection units transmits utility meter data to a second remote collection unit of the plurality of remote collection units, wherein the second remote collection unit transmits the utility meter data of the first and second remote collection units in a single data packet payload to a third remote collection unit of the plurality of remote collection units, and wherein the third remote collection unit transmits utility meter data of the first, second, and third remote collection unit in the single data packet payload to the field collection unit.